

Wildfires

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Briefing for Congressional Staff

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Summary

There are four main components to CBO's report on wildfires:

- Trends in wildfire activity
- Federal spending arising from wildfires
- Environmental, health-related, and economic effects of wildfires
- Forest-management practices and wildfire risk

Trends in Wildfire Activity

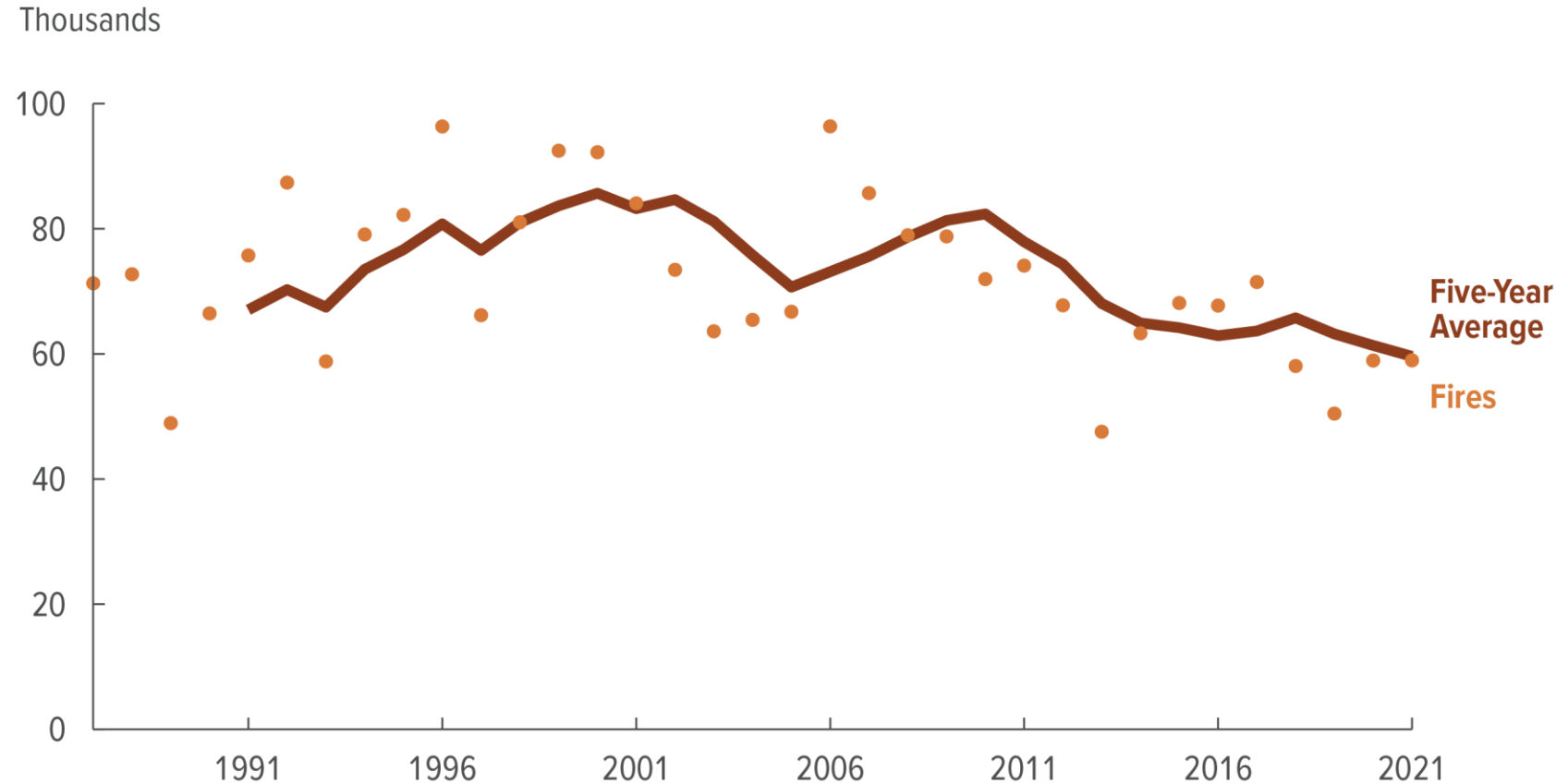
Number of fires and acres burned

Federal and nonfederal lands

Regional differences

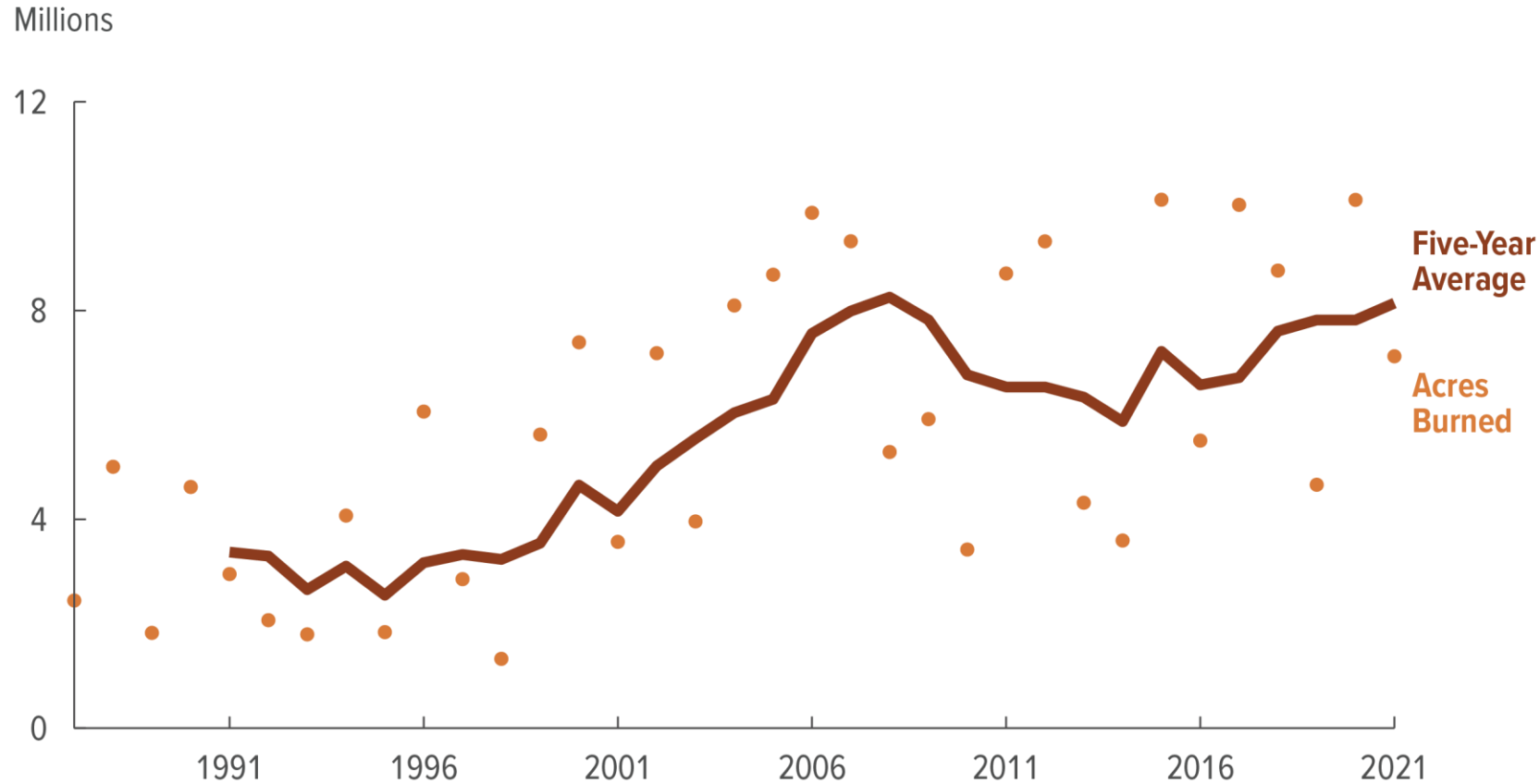
Burn severity

Number of Wildfires, 1987 to 2021



The number of wildfires that occur each year in the United States has fluctuated over the past 30 years. Over the past decade, the five-year moving average of the number of wildfires has decreased. There has been no comparable decrease in the land area affected by wildfires because the average wildfire has grown larger over time.

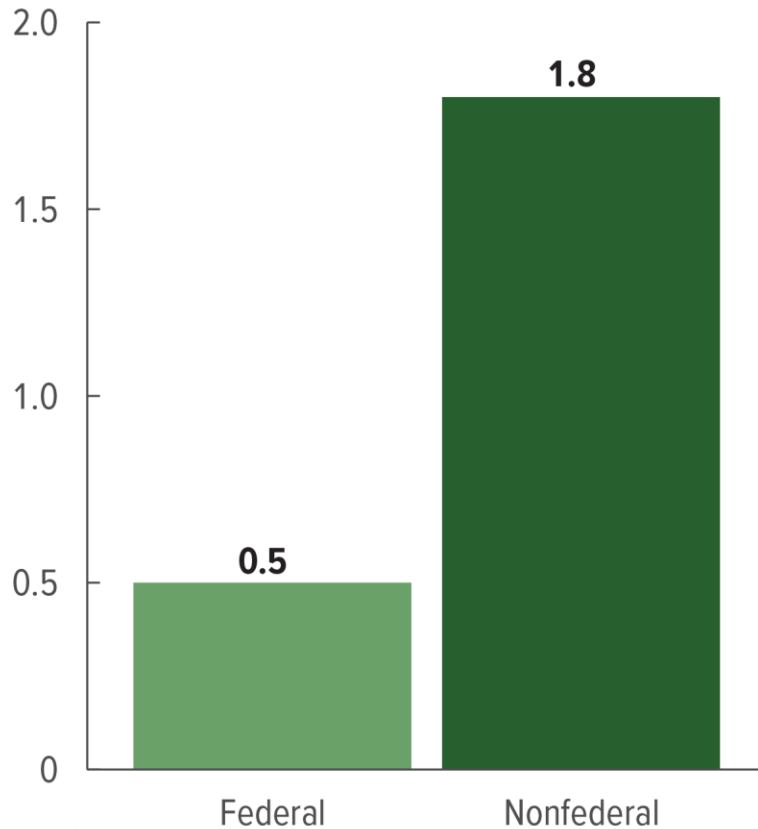
Number of Acres Burned, 1987 to 2021



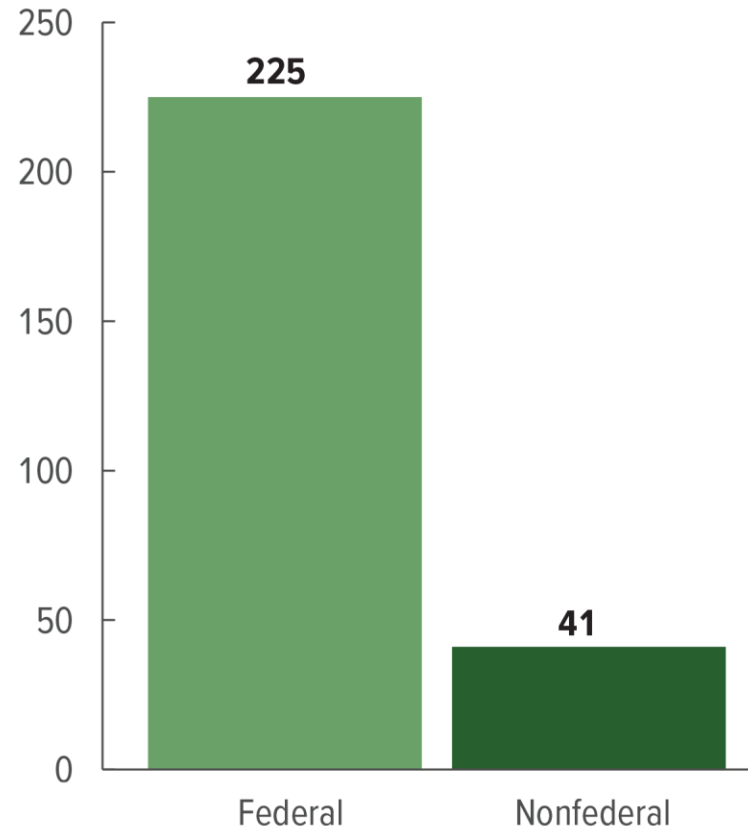
Although the number of acres burned fluctuates from year to year, by 2021 the five-year moving average of acres burned was about double what it had been in the early 1990s.

Total Number of Wildfires on Federal and Nonfederal Lands and Average Acres per Fire, 1991 to 2021

Millions of Fires



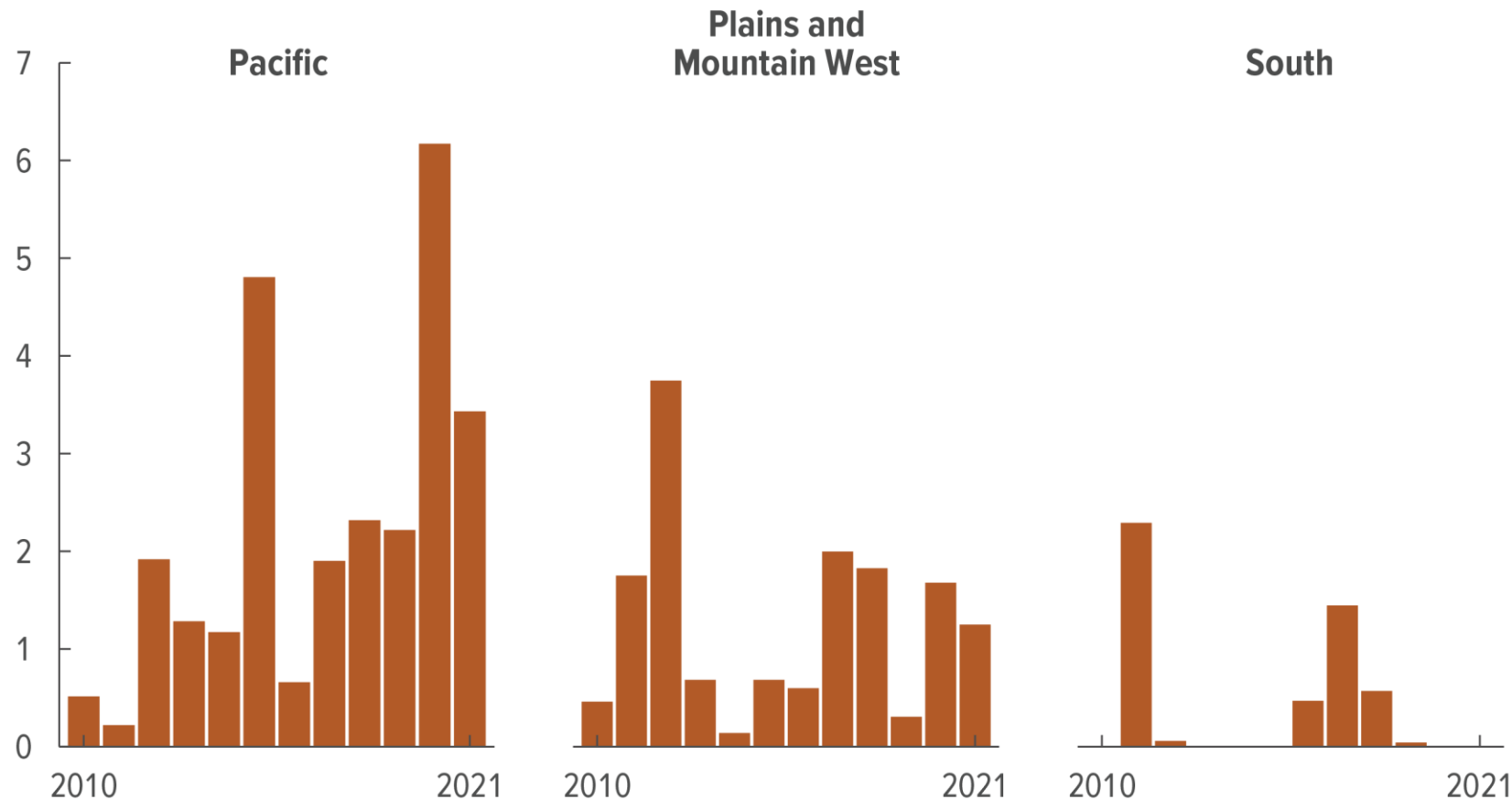
Acres per Fire



Although fewer wildfires occur on federal lands than on nonfederal lands, fires that burn on federal lands have been about five times larger, on average, over the past three decades. Wildfires on federal lands are more likely to occur in remote areas and threaten fewer structures and communities, which may reduce the urgency of suppression efforts.

Acres Burned in Fires of More Than 40,000 Acres, by Region

Millions of Acres



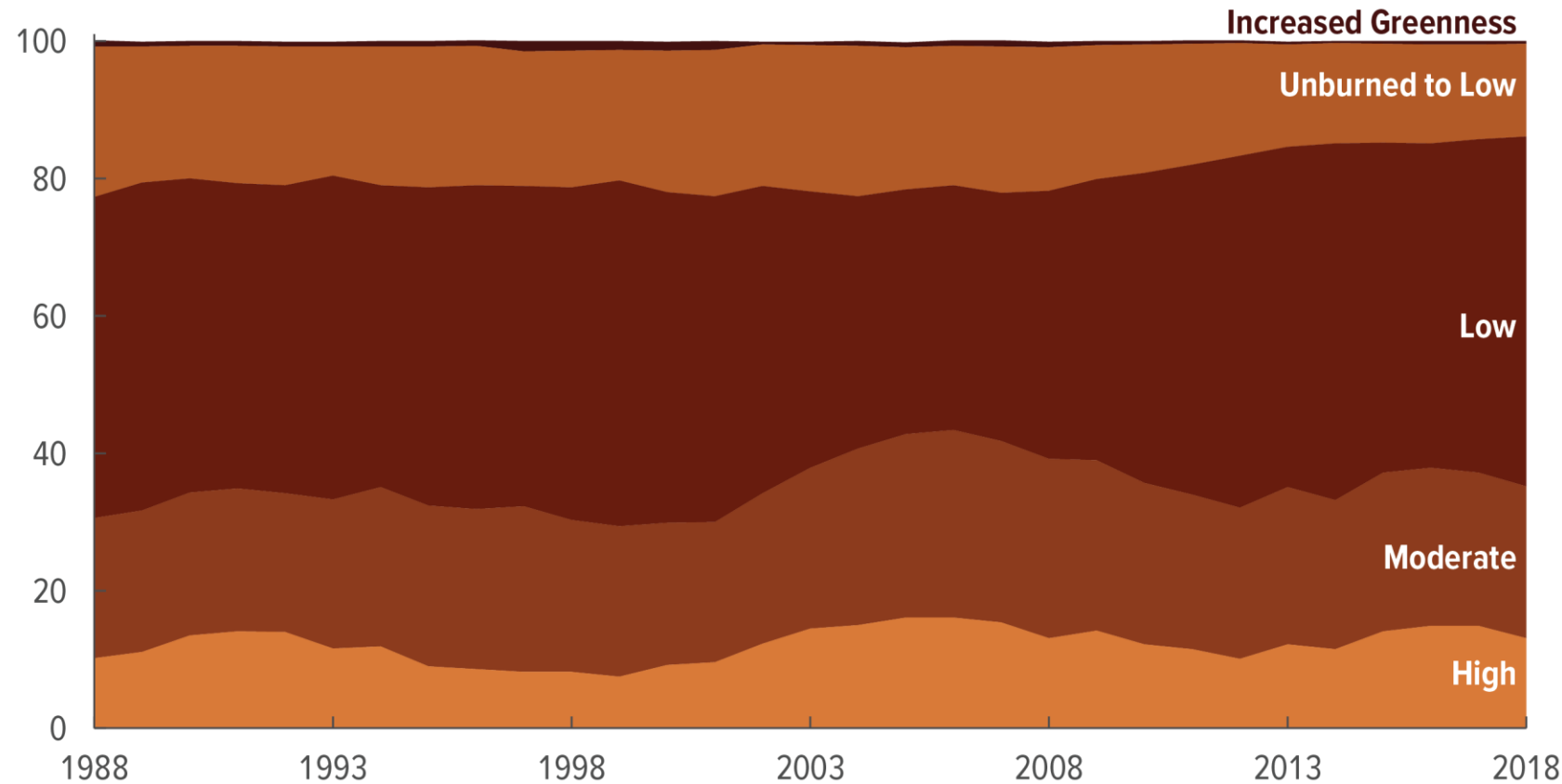
Large wildfires are more prevalent in the western United States. In most years over the past decade, the states bordering the Pacific Ocean have seen the most acres burned in large wildfires, but other areas of the country can also experience large wildfires.

Data source: National Interagency Coordination Center, *Wildland Fire Summary and Statistics Annual Report*, all years from 2000 to 2021, www.predictiveservices.nifc.gov/intelligence/intelligence.htm. See www.cbo.gov/publication/57970#data.

Pacific states are Alaska, California, Oregon, and Washington. Plains and Mountain West states are Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah, and Wyoming. Southern states are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

Share of Acres Burned in Wildfires, by Burn Severity Class

Percent, Five-Year Average



Wildfires' effects on the vegetation they encounter vary. Fires can enhance growth in areas where they burn at lower severity by consuming dead materials and releasing nutrients into the soil. Where fires burn at high severity, they can cause extensive damage to trees and soils.

Forest Management, Climate Change, the Wildland-Urban Interface, and Wildfire Risk

Wildfires have grown in reach and severity in recent years, probably owing to several factors.

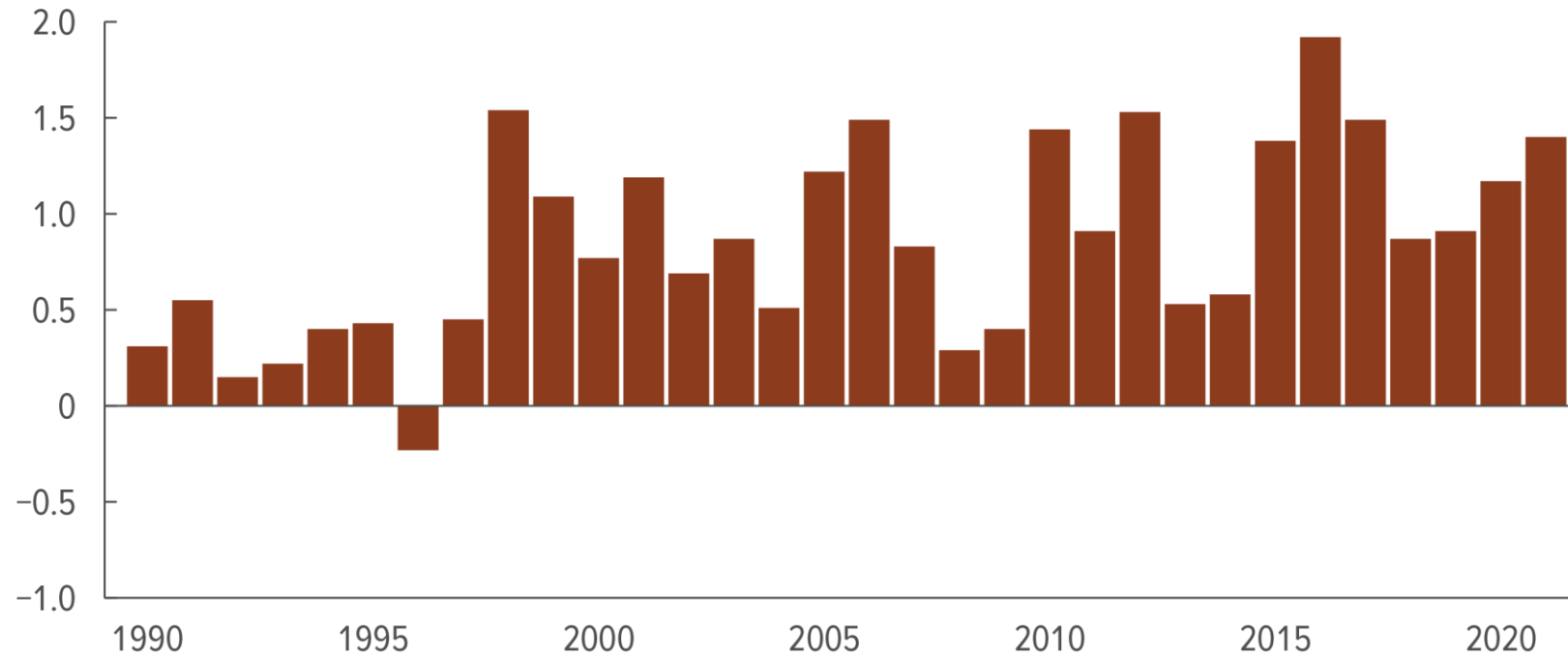
According to researchers, those factors include:

- Forest-management practices
- Climate change
- Expansion of the wildland-urban interface

Climate Trends That Contribute to Wildfires

Degrees Celsius

Temperature Difference From the 1910–2000 Average for North America

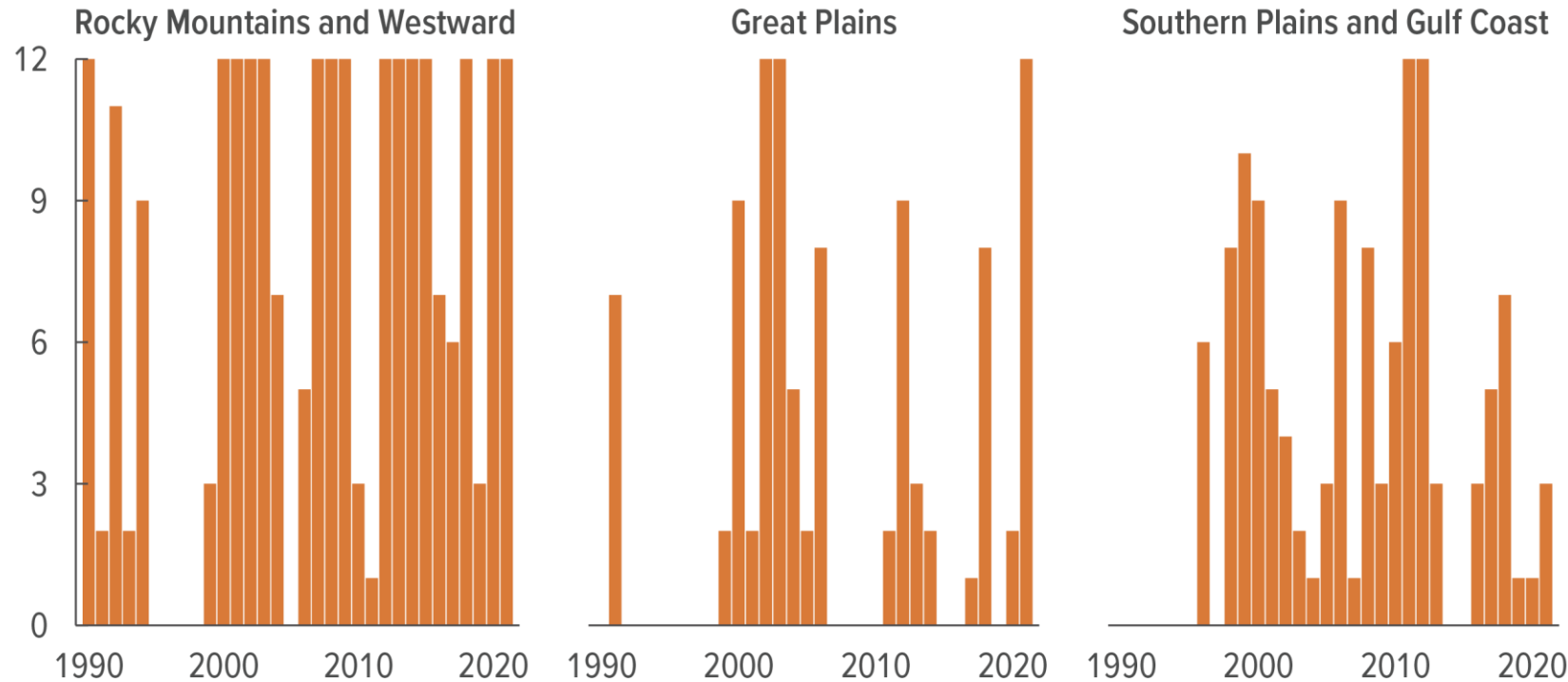


Hotter, drier weather creates conditions that are more favorable to wildfires by leaving vegetation and plant debris drier and easier to ignite. Temperatures have exceeded historical averages across North America in almost all years since 1990.

Climate Trends That Contribute to Wildfires (Continued)

Number of Months

Abnormally Dry or Drought Months, by Region



From the Rocky Mountains westward, drought or abnormally dry conditions have persisted throughout much or all of the year for most of the past two decades. Other regions have also experienced many months of abnormally dry or drought conditions.

Data source: National Oceanic and Atmospheric Administration, National Centers for Environmental Information, “Climate at a Glance: Regional Time Series,” published March 2022 and accessed April 6, 2022, www.ncdc.noaa.gov/cag/. See www.cbo.gov/publication/57970#data.

Droughts are classified according to the Palmer drought severity index. Areas with an index value of less than -1 are classified as abnormally dry, and those with less than -2 are experiencing drought.

Rocky Mountains and Westward encompasses Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, and portions of Colorado, Montana, New Mexico, and Wyoming. The Great Plains region is Kansas, Nebraska, North Dakota, Oklahoma, South Dakota, and portions of Colorado, Montana, New Mexico, and Wyoming. The Southern Plains and Gulf Coast region comprises Florida, Louisiana, Texas, and portions of Alabama, Arkansas, Georgia, Mississippi, New Mexico, and Oklahoma.

Federal Spending Arising From Wildfires

Fire suppression

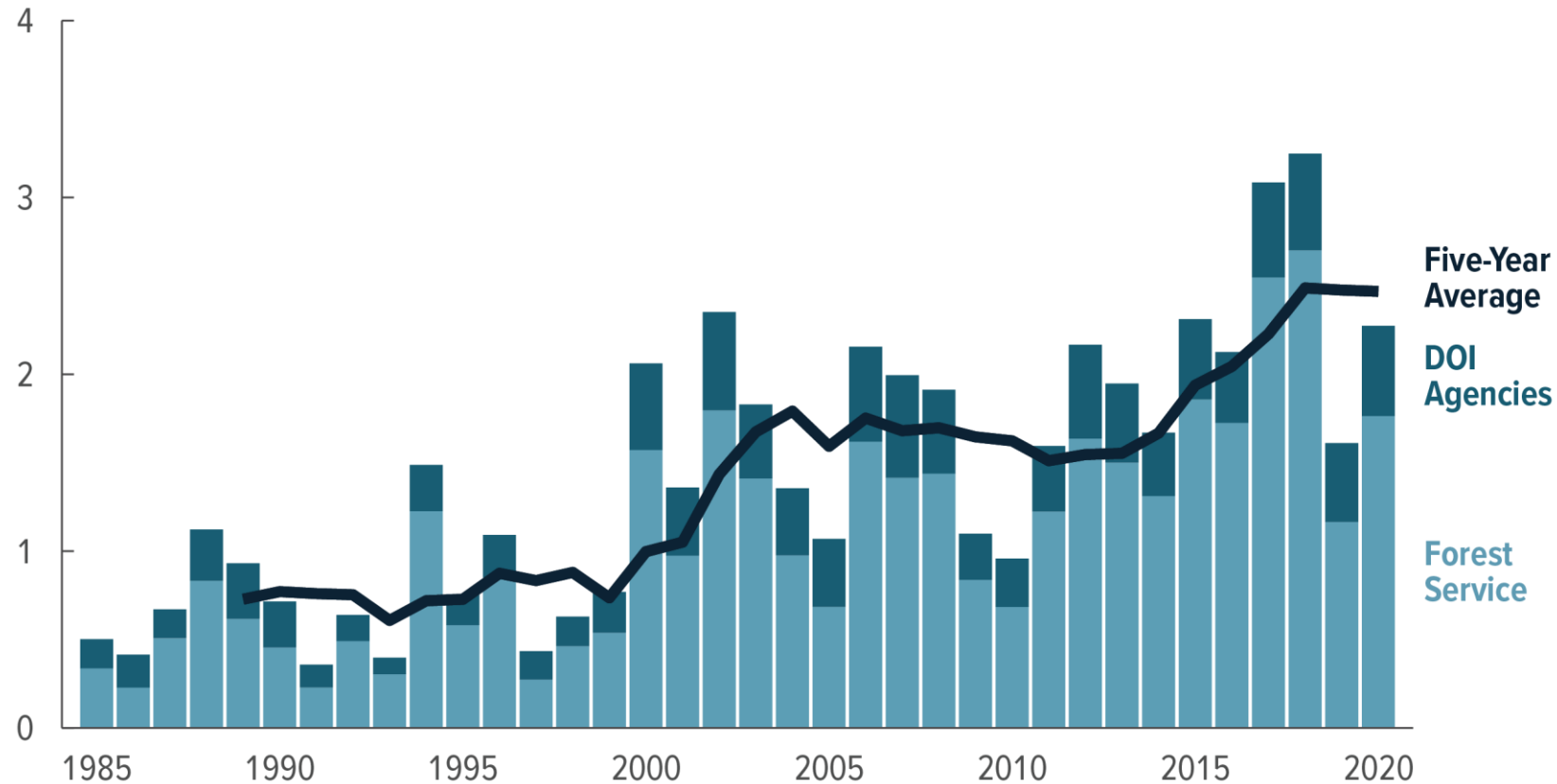
Coordination of efforts

Disaster and recovery assistance

Other effects on the federal budget

Spending on Wildfire Suppression by the U.S. Forest Service and Department of the Interior

Billions of Dollars



The Forest Service and several DOI agencies are responsible for managing wildfires on federal lands. In 2020, those lands accounted for 70 percent of the acres burned in wildfires. Between 1989 and 2020, the five-year moving average for federal spending on wildfire suppression more than tripled in inflation-adjusted terms.

Data source: National Interagency Fire Center, "Suppression Costs," www.nifc.gov/fire-information/statistics/suppression-costs. See www.cbo.gov/publication/57970#data.

DOI = Department of the Interior.

Disaster Declarations for Wildfires and Assistance Obligated as of April 8, 2022

	Fire Management Assistance Declarations		Emergency Declarations		Major Disaster Declarations		
	Number of Declarations	Total Public Assistance and Hazard-Mitigation Assistance Obligated (Millions of dollars)	Number of Declarations	Total Public Assistance Obligated (Millions of dollars)	Number of Declarations	Total Individual and Household Assistance Approved (Millions of dollars)	Total Public Assistance and Hazard-Mitigation Assistance Obligated (Millions of dollars)
2001 to 2005	243	340	0	0	5	34	130
2006 to 2010	264	348	4	249	5	25	292
2011 to 2015	258	562	2	0	12	34	523
2016 to 2020	266	830	4	0	9	193	3,544

Environmental, Health-Related, and Economic Effects of Wildfires

Environmental effects:

- Vegetation, erosion, water quality
- Air pollution and carbon dioxide (CO₂) emissions

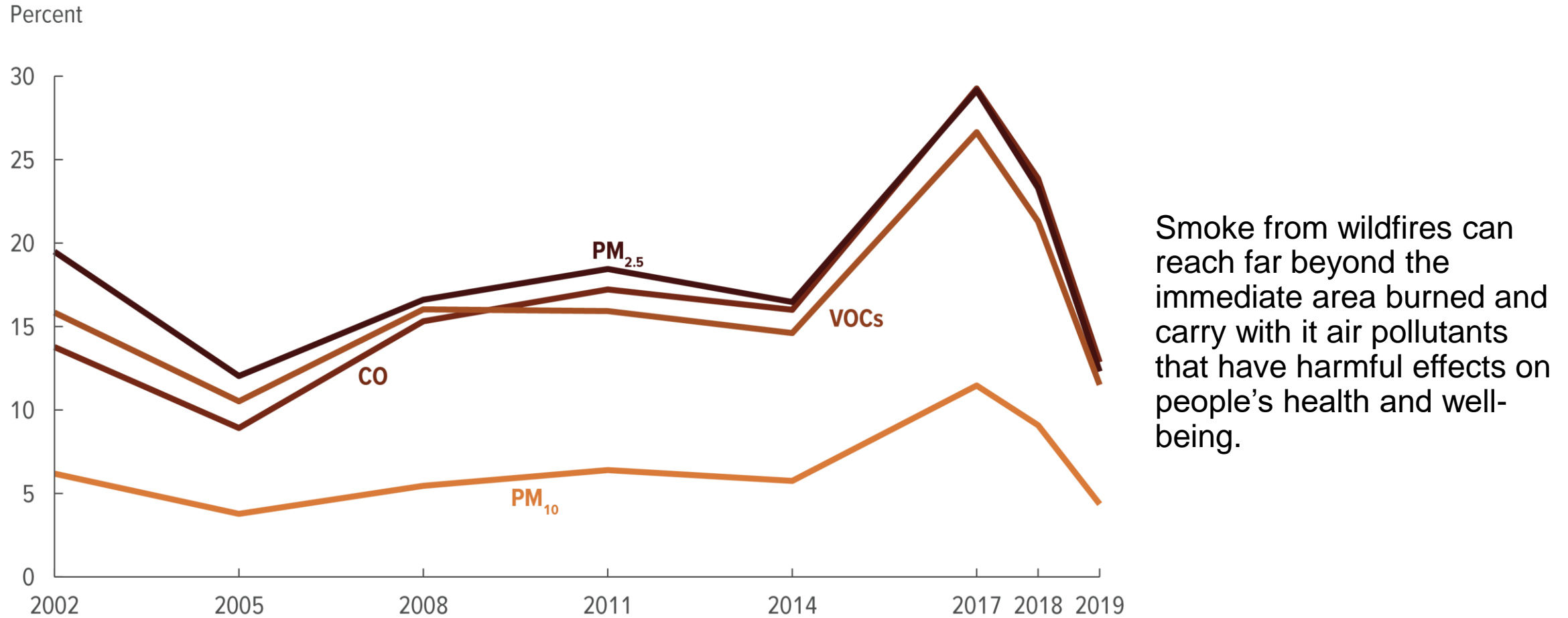
Health-related effects:

- Local
- National (from smoke exposure)

Economic effects:

- Estimates in economic impact assessments
- Estimates for effects on municipalities, housing, and insurance

Wildfires' Share of National Emissions of Certain Air Pollutants, Selected Years, 2002 to 2019

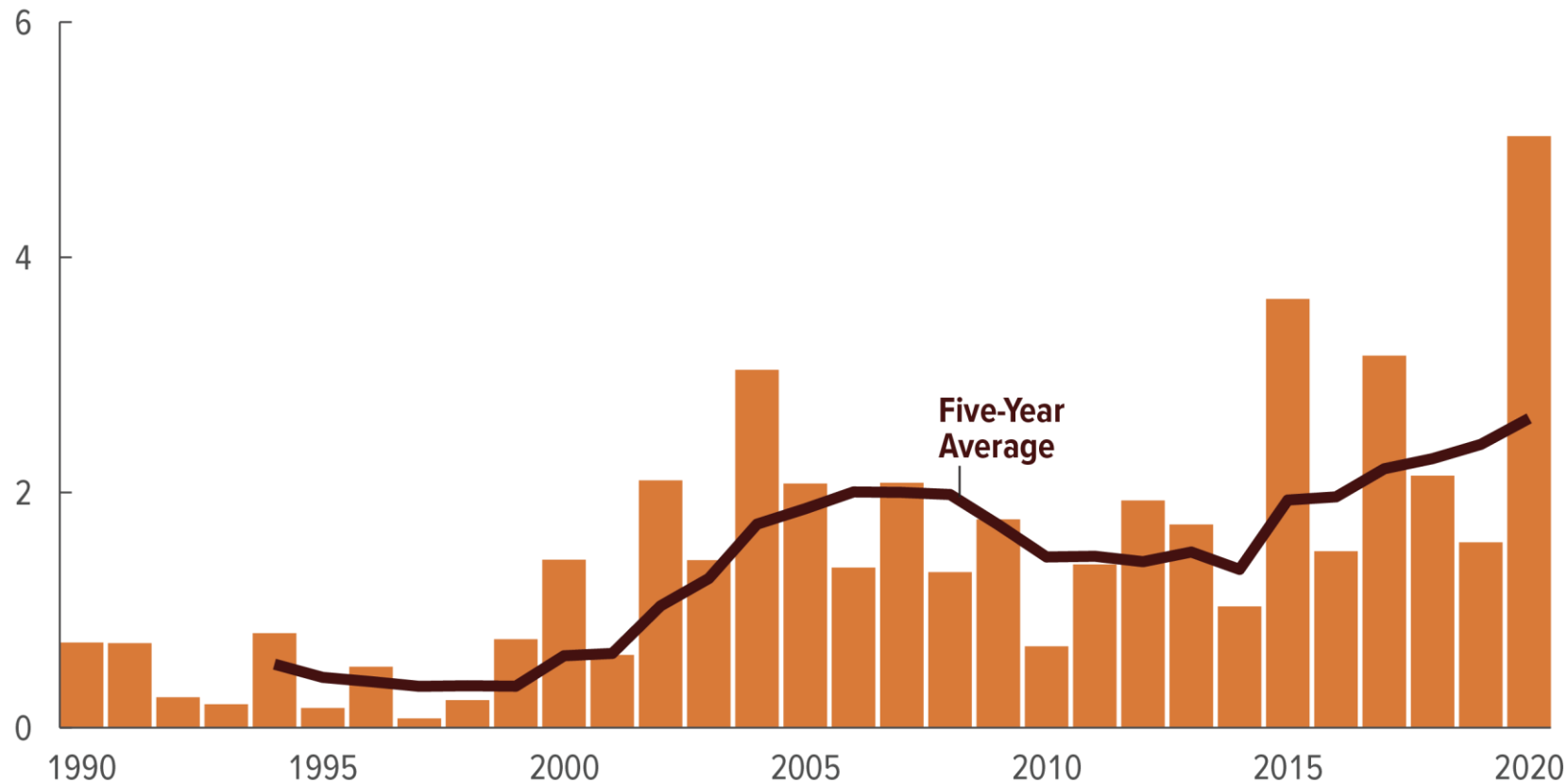


Data source: Environmental Protection Agency, "Air Pollutant Emissions Trends Data, National Tier 1 CAPS Trends," www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data. See www.cbo.gov/publication/57970#data.

CO = carbon monoxide; PM₁₀ = particulate matter that is 10 micrometers in diameter or smaller; PM_{2.5} = particulate matter that is 2.5 micrometers in diameter or smaller; VOCs = volatile organic compounds.

Wildfires' Contribution to National Emissions of Carbon Dioxide

Percentage of Total Gross CO₂ Emissions



Wildfires account for a growing share of national carbon dioxide emissions because wildfire emissions have increased and emissions from other sources have decreased.

Forest-Management Practices and Wildfire Risk

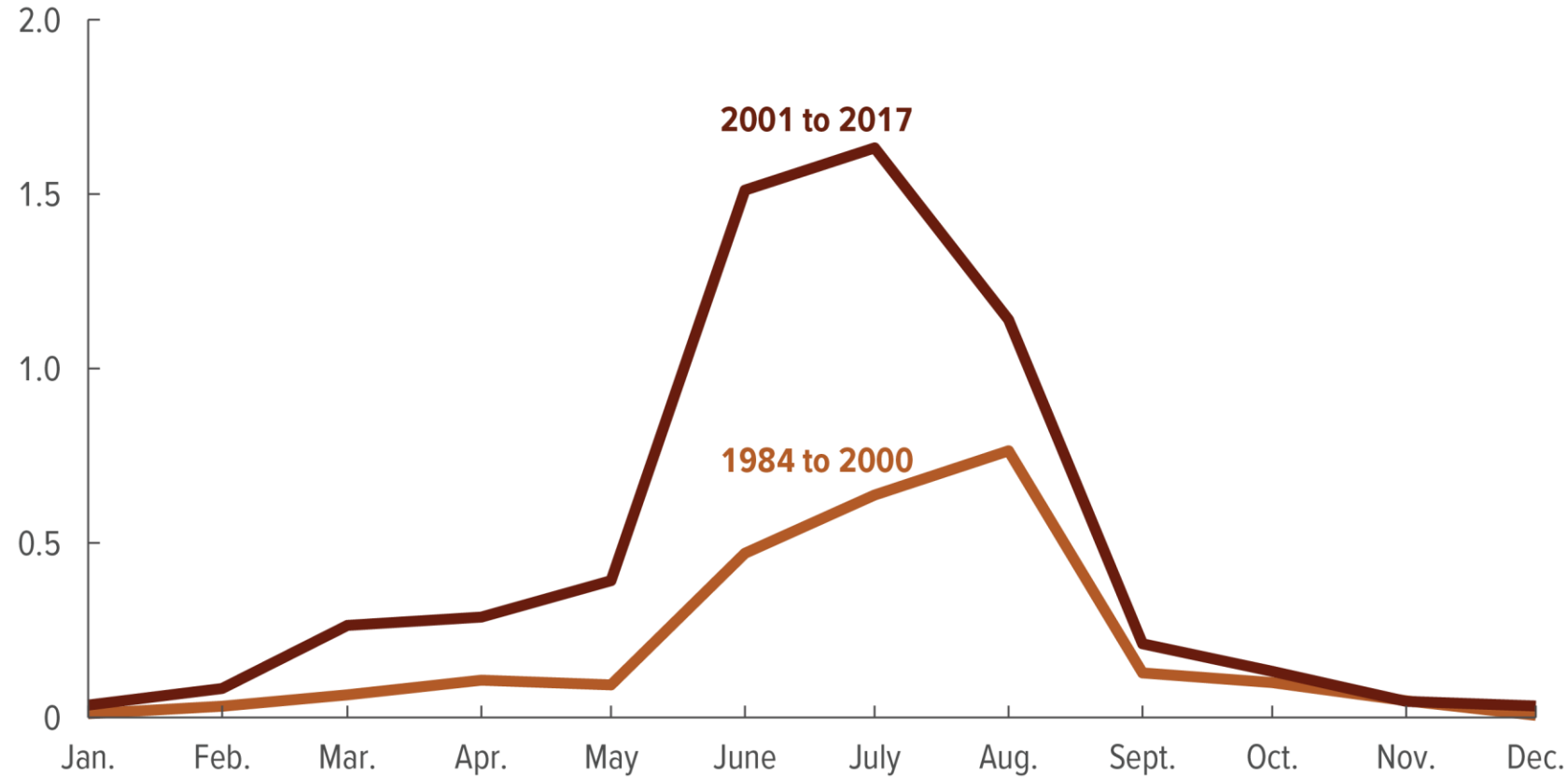
Effects of forest-management practices

Use of forest-management practices

Obstacles to use of fuel treatments

Acres Burned Each Month as a Result of Wildfires

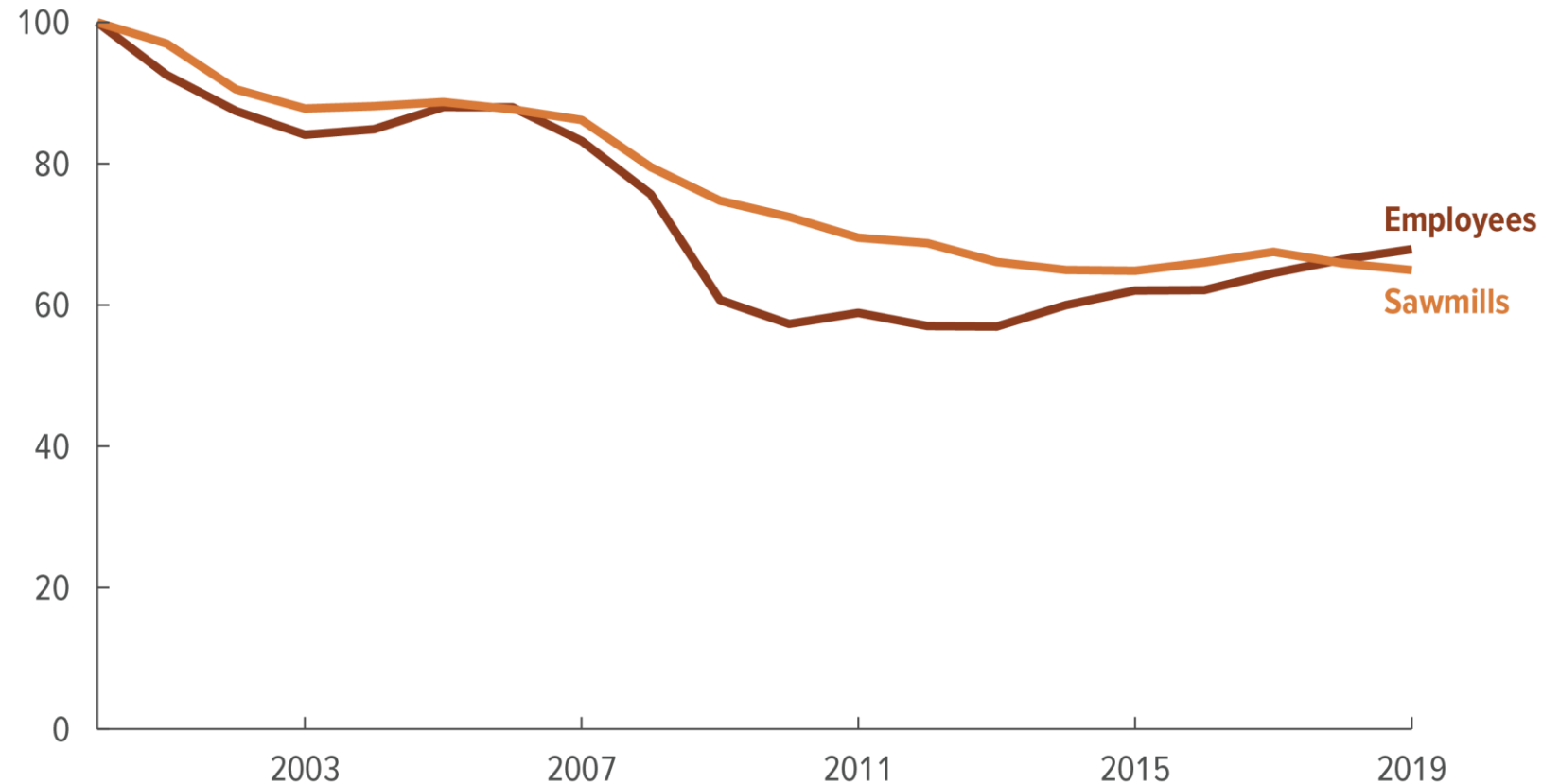
Millions of Acres per Year



Wildfires have traditionally peaked in the summer months. Increases in the number of acres burned have not been confined to those summer months, however, but have expanded earlier into the spring.

Changes in the Number of Sawmills and Employees Since 2000

Index, 2000 = 100



With fewer sawmills available to process the vegetation removed from mechanical thinning operations or recovered from areas burned in wildfires, it is more difficult to capture the value of those materials in ways that might offset fuel treatment costs.